30. (Amended) Apparatus according to claim 10 arranged to determine a measure of strength of pulp to be produced from a solid wood member.

Please cancel claim 24.

Please add the following new claim.

31. (Amended) A method as set forth in claim 1, including the steps of selecting solid wood members for use as raw material in the production of wood pulp or wood fibre based on the assessment and producing wood pulp or wood fibre from the selected solid wood members.

REMARKS

Claims 1 through 23 and 25 through 30 remain in this application. Claim 24 has been cancelled as duplicative of claim 25. Claims 1-5, 8-13, 16, 19 and 25-30 have been amended herewith. Claim 1 stands rejected under 35 U.S.C. §102(b) and all of the claims currently pending stand rejected under 35 U.S.C. §103(a).

The present application is directed to methods and apparatus for predictively assessing at least one characteristic of a solid wood member based on detecting the velocity of sound through a solid wood member. At the outset, it is important to recognize that the present application is not directed merely to the transmission of sound through wood, nor to assessing the properties of wood pulp or wood fibre after processing. Rather, this invention is directed to measuring the sound velocity through a solid wood member and then predicting the properties of the wood fibre or wood pulp to be produced from that member from the determined sound velocity. By such an assessment as to which logs or other solid wood members are appropriate in a pulping or fibre production process, the processor may more accurately produce, e.g., a desired quality of paper from the pulp by selection or blending not merely of wood types but of specific logs or other wood members.

In the first Office Action, U.S. Patent Nos. 5,760,308 and 5,804,728 to Beall et al. have been cited as anticipating Claim 1 of the present application. Because the disclosure is the same, the '308

patent being a continuation of a divisional application, they will henceforth be referred to collectively as Beall. For the reasons set forth below, Applicants submit that Beall is not anticipatory of Claim 1, either as filed or as amended. However, Applicants have amended Claim 1 to clarify the distinction between the present invention and the Beall patents, and to demonstrate that Beall neither teaches or suggests, alone or in combination with Chase, the present invention.

The patents to Beall are directed to a method of using sound to determine the fundamental soundness of wood *in situ*. Simply put, Beall teaches uses sound as a non-intrusive method to "detect bio-deterioration, and other conditions, in living trees and round wood materials ...". Col. 3, lines 65-67. The invention is useful in determining the condition of living trees as noted above, and has particular application in the utility industry to determine the condition of poles. See Col. 4, lines 6-32. Beall uses a transducer to generate and another transducer to receive sound which are diametrically opposite to one another, and then used "to determine the condition of the round wood in the vicinity of the transducers." Col. 4, lines 43-44. However, the Beall patents are completely silent as to the use of sound velocity in the prediction of a characteristic of wood fibre or wood pulp to be produced from the wood, which is an essential step of claim 1.

In order for a reference to anticipate, it must disclose every element of the claimed invention and must enable a skilled artisan to practice the claimed invention. "[I]nvalidity by anticipation requires that the four corners of a single, prior art document describe every element of the claimed invention, either expressly or inherently, such that a person of ordinary skill in the art could practice the invention without undue experimentation." *Advanced Display Systems, Inc. v. Kent State University*, 54 USPQ2d 1673, 1679 (Fed. Cir. 2000). "To anticipate a claim, a reference must disclose every element of the challenged claim and enable one skilled in the art to make the anticipating subject matter." *PPG Ind. Inc. v. Guardian Ind. Corp.*, 37 USPQ2d 1618, 1624 (Fed. Cir. 1996). Furthermore, the elements must be arranged as in the claim. *Richardson v. Suzuki Motor*

Co., 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). In sum, "[t]he identical invention must be shown in as complete detail as is contained in the patent claim." *Id.*

Here, there is a complete absence of any showing, teaching or suggestion in Beall as to the limitation of predictively assessing the characteristic of wood pulp or wood fibre to be produced from the wood on which the sound velocity measurement is obtained. This limitation is found both in the method claims and the apparatus claims calling for a computer which performs this function. Thus, while applicants agree that the Beall patents teach the use of sound velocity measurements as called for in the claims, to say that Beall anticipates claim 1 completely ignores the predictive assessment of a characteristic of wood pulp or wood fibre to be produced from the wood member as called for in the claims. It is thus manifest that Beall does not anticipate, or even teach or suggest the use of sound velocity measurements in the context of predicting a characteristic of wood fibre or wood pulp to be produced from the wood.

By way of illustration, the situation is analagous to medical testing. The use of tests to determine levels of C-reactive protein and obtaining those values have been well known. However, the use of those levels as an incident to predicting heart attacks in healthy non-smokers was not. U.S. Patent No. 6,040,147 is beneficially illustrative of this situation, and reflective of the difference between simply obtaining a value which may be known on the one hand, and using that value as part of a process for predictive assessment.

As a secondary reference applied in combination with the Beall patents to all of claims 1-30, the first Office Action cites U.S. Patent No. 5,013,403 to Chase. The Chase patent is concerned with continuously determining the strength of paper sheet material during manufacture by using a plurality of sensors to detect the individual strength of fibers, length distribution of fibers, quantity of fibers, distribution of fibers, orientation of fibers, number of bonds between fibers, and bond strength of fibers. However, applicants invention recognizes that fiber length and other fiber characteristics are

a fundamental aspect of paper production and other uses of pulp. See page 2, lines 19 et seq. Chase tests these properties during the papermaking process on the produced paper. Such testing is of no benefit in regard to the selection of which solid wood members are to be used to produce wood pulp or wood fibre, as the testing is conducted after the fact. Chase is entirely silent in connection with regard to the use of sound velocity through solid wood in any predictive manner. Chase is entirely silent as to any tests which may be performed on the solid wood members prior to pulping, much less the use of sound velocity as a predictor of the characteristics of wood fiber or wood pulp.

There is no teaching or suggestion in the art to combine the Beall patents with Chase. Neither is concerned with the same problem, nor any in way suggests the combination. There would be no motivation to combine Beall's prediction of the character of *in situ* wood with Chase's testing of fiber proxies during paper manufacturing absent hindsight gained by the teachings of applicant. Furthermore, even if Beall and Chase are combined, the two references still fail to teach or suggest the present invention. Beall teaches the use of ultrasound velocity through the wood, but does not teach or suggest the use of velocity as a predictor of wood pulp or wood fiber characteristics, and Chase does not teach or suggest any predictive assessment of wood pulp or wood fiber based on solid wood sound velocity testing. There is no teaching or suggestion in either reference to bridge the gap regarding predicting how solid wood members may be assessed and selected for use in papermaking, much less that sound velocity may be used as such a predictor.

For all of the foregoing reasons, applicants submit that the claims as amended clearly and patentably define over the prior art. Accordingly, early issuance of the Notice of Allowance is courteously requested. Should any additional fees be due in connection with this submission, they may be charged to deposit account 19-0522. Any issues which remain and may be resolved by a telephone conference may directed to the undersigned at 1-800-445-3460.

Respectfully submitted,

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(Docket No. 31386)

Inventor: ALBERT, Denis John et al.
Title: METHOD OF SELECTING AND/OR PROCESSING WOOD ACCORDING TO FIBRE CHARACTERISTICS
Application Serial No. 09/763,511
Group Art Unit: 1731
Examiner: ALVO, Steve

MARKED UP COPY OF AMENDMENT TO SHOW CHANGES MADE

Please amend the claims as follows:

1. (Twice Amended) A method for predictively assessing one or more characteristics of wood fibre or wood pulp to be produced from a solid wood member, comprising the steps of:

causing sound to be transmitted through the solid wood member;

determining the velocity of the transmitted sound through the solid wood member[,]; and

predictively assessing at least one characteristic[s] of wood fibre or wood pulp to be produced from the solid wood member by reference at least in part to the determined sound velocity [of sound] through the solid wood.

2. (Twice Amended) A method for predictively assessing one or more characteristics of wood fibre or wood pulp to be produced from a solid wood member, comprising the steps of:

causing a sound wave to be transmitted through the solid wood member[,];

determining the velocity of the sound wave through the solid wood member[,]; and

comparing the [result] determined sound wave velocity to stored information on at least one fibre characteristic[(s)] versus sound velocity through the wood-type to determine at least in part said at least one [the] fibre characteristic[(s)] for wood pulp or wood fibre to be produced from the solid wood member.

3. (Twice amended) A method for predictively assessing one or more characteristics of wood fibre or wood pulp to be produced from a solid wood member having one end and another end longitudinally spaced from the one end along the length of the solid wood member, comprising the steps of:

placing a sensing means capable of detecting sound in the solid wood member in contact with or within sensing distance of one end of the length of the solid wood member[,];

placing a second sensing means capable of detecting sound in the solid wood member in contact with or within sensing distance of another end of the length of the solid wood member;[,]

causing a sound wave to be transmitted in the length of the solid wood member from one end to the other end;[,]

detecting the sound at each end of the length of the solid wood member via the sensing means and determining the velocity of the transmitted sound in the wood[,]; and

predictively assessing at least one characteristic[(s)] of wood fibre or wood pulp to be produced from the solid wood member by reference to stored information on at least one fibre characteristic[(s)] versus sound velocity through the wood.

4. (Twice Amended) A method for predictively assessing one or more characteristics of wood fibre or wood pulp to be produced from a solid wood member having one end and another end longitudinally spaced from the one end along the length of the solid wood member including the steps of:

placing means capable of detecting both an original and a reflected sound wave in contact with or within sensing distance of one end of a length of a solid wood member;[,]

causing a sound wave to be transmitted in the length of the solid wood member;[,]

detecting a reflected echo of the sound wave in the solid wood member;[,]

determining the velocity of the sound wave in the solid wood member;[,] and

predictively assessing at least one characteristic[(s)] of wood fibre or wood pulp to be produced from the solid wood member at least in part by reference to stored information on at least one fibre characteristic[s] versus sound velocity through the wood.

5. (Twice Amended) A method according to claim 1, wherein the solid wood member has a length and at least one end, [including] wherein the step of causing a sound [wave] to be transmitted through the solid wood member is caused by impacting one end of the length of the solid wood member.

8. (Twice Amended) A method of segregating solid wood members for use in pulp and paper or fibre board production including determining at least one [or more] fibre characteristic[s] of [the] individual [lengths of the] solid wood members using the method of claim 1.

9. (Twice amended) Apparatus for predictively assessing at least one [or more] characteristic[s] of wood fibre or wood pulp to be produced from a solid wood member, comprising:

a sensor capable of detecting the velocity of a sound wave through a solid wood member along the length thereof [of wood,]; and

a computer comprising stored information on at least one fibre characteristic[s] of produced wood fibre or wood pulp versus sound velocity through wood and arranged to determine the at least one fibre characteristic[(s)] for the wood fibre or wood pulp to be produced by reference to said stored information on the at least one fibre characteristic[s] versus detected velocity through the solid wood member.

10. (Twice Amended) Apparatus for predictively assessing at least one [or more] characteristic[s] of wood fibre or wood pulp to be produced from a solid wood member, comprising:

a sensor capable of detecting both an original and a reflected sound wave in a solid wood member along the length thereof [of wood,]; and

a computer comprising stored information on fibre characteristics versus sound velocity through wood and arranged to determine the at least one fibre characteristic[(s)] for the wood fibre or wood pulp to be produced by reference to said stored information on the at least one fibre characteristic[s] versus detected velocity through the solid wood member.

11. (Twice Amended) Apparatus according to claim 9 arranged to determine a measure of the average fibre length of wood fibre to be produced from a solid wood member.

12. (Twice Amended) Apparatus according to claim 9 arranged to determine a measure of strength of pulp [formed from the wood] to be produced from a solid wood member.

13. (Amended) A method according to claim 2, wherein the solid wood member has a length and at least one end, wherein [including] the step of causing a sound wave to be transmitted through the solid wood member is caused by impacting one end of the length of the solid wood member.

16. (Amended) A method according to claim 3 [including] wherein the step of causing a sound wave to be transmitted through the solid wood member is caused by impacting one end of the length of the solid wood member.

19. (Amended) A method according to claim 4 [including] wherein the step of causing a sound wave to be transmitted through the solid wood member is caused by impacting one end of the length of the solid wood member.

25. (Amended) A method of segregating solid wood members for use in pulp and paper or fibre board production including determining at least one [or more] fibre characteristic[s] of [the] individual [lengths of the] solid wood members using the method of claim 2.

26. (Amended) A method of segregating solid wood members for use in pulp and paper or fibre board production including determining at least one [or more] fibre characteristic[s] of [the] individual [lengths of the] solid wood members using the method of claim 3.

27. (Amended) A method of segregating solid wood members for use in pulp and paper or fibre board production including determining at least one [or more] fibre characteristic[s] of [the] individual [lengths of the] solid wood members using the method of claim 4.

28. (Amended) A method of segregating solid wood members for use in pulp and paper or fibre board production including determining at least one [or more] fibre characteristic[s] of [the] individual [lengths of the] solid wood members using the method of claim 5.

29. (Amended) Apparatus according to claim 10 arranged to determine a measure of the average fibre length of wood fibre to be produced from a solid wood member.

30. (Amended) Apparatus according to claim 10 arranged to determine a measure of strength of pulp [formed from the wood] to be produced from a solid wood member.

Please cancel claim 24.

Please add the following new claim.

31. (Amended) A method as set forth in claim 1, including the steps of selecting solid wood members for use as raw material in the production of wood pulp or wood fibre based on the assessment and producing wood pulp or wood fibre from the selected solid wood members.